



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,166	07/26/2006	Tomohiro Imai	L9289.06171	7273

52989 7590 07/22/2009

Dickinson Wright PLLC  
James E. Ledbetter, Esq.  
International Square  
1875 Eye Street, N.W., Suite 1200  
Washington, DC 20006

EXAMINER
----------

JAMA, ISAAK R

ART UNIT	PAPER NUMBER
----------	--------------

2617

MAIL DATE	DELIVERY MODE
-----------	---------------

07/22/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/587,166	<b>Applicant(s)</b> IMAI, TOMOHIRO	
	<b>Examiner</b> ISAAK R. JAMA	<b>Art Unit</b> 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03/10/2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed on 03/10/2009 have been fully considered but they are not persuasive.
2. Applicant argues that Miyata's disclosure of determining whether to perform space division multiple access communication is not the same as the Applicants' claimed subject matter of determining whether to perform space division multiplexing communication with or without directivity control (Applicant's features 1-3). Examiner would like to point out that in the space division multiplexing scheme, each one of a plurality of antennas are "null-steered" and the radio signals are spatially divided for every propagation path. When radio signals are null-steered, a main beam of a beam pattern is adjusted to point towards a desired wave-arriving direction and a null point of the beam pattern is adjusted to point toward an undesired wave-arriving beam direction. In light of the above, directivity of the antenna beam towards a desired signal, hence, space division multiplexing requires directivity control. Miyata indeed discloses that an error between a value of a signal received from the first mobile station and a value of a reference signal for the first mobile station, and the judging means judges to perform space-division multiple access communication when the error is not larger than a predetermined value [Paragraph 0019], and that it is judged to perform space-division multiple access communication when the error is not larger than the predetermined value, and not to perform the space-division multiple access communication when the error is larger. This achieves the effect of ensuring accuracy in directivity pattern

Art Unit: 2617

formation, thereby improving the communication quality [Paragraph 0020]. In regard to the Applicant's argument that Mills' disclosure of producing a correlation result of "0" or "1" is not the same as the Applicants' claimed subject matter of outputting "1" as a transmitting weight to a multiplying section upon receiving a signal including an instruction to perform space division multiplexing communication without directivity control. Mills is in the same endeavor as Miyata and Yamada, and that depending on a correlation value, a "0" is detected for large positive correlation and a "1" for a large negative correlation [Columns 2 & 3, lines 65-67 and 1-2]; since correlation determination between a channel estimation value of a known symbol of a received signal received earlier and the channel estimation value of the known symbol of a currently received signal is a prerequisite for generating the correlation value of "1" as claimed in claims 2, 4, 5 and 6, Mills' disclosure of generating correlation value of "1" when a large negative correlation is determined would result in not performing space-division multiplexing.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2617

3. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication Number 2005/0129137 (Yamada et al.) in view of U.S. Patent Application Publication Number 2004/0022205 (Miyata et al.).

4. Regarding claims 1 and 4, Yamada teaches a transmitting/receiving apparatus **[Figure 1 - Yamada]** comprising: a channel estimation section that performs channel estimation for a known symbol of a received signal **[Figure 3, # 204, paragraph 0073 - Yamada]**; Yamada also teaches storing past information of channel estimation **[Figure 20, step S242 - Yamada]**, correlating between a channel estimation value of a known symbol of a received signal received earlier and stored in said storage section and the channel estimation value of the known symbol of the currently received signal **[Figure 20, step S243 - Yamada]**, generating transmission weights based on the channel estimation **[Figure 20, step S341 - Yamada]**, and sending the transmission weights to the transmitter **[Figure 20, step S441 - Yamada]**. In addition, Yamada teaches a multiplying section **[Figure 1, # 209 - Yamada]** section that multiplies a transmission signal by the transmitting weight generated at said weight generating section **[Page 1, paragraph 0008 - Yamada]**, and a transmitting section that transmits the signal multiplied by the transmitting weight at said multiplying section **[Page 30, paragraph 0443 - Yamada]**. But Yamada fails to specifically teach a value enabling space division multiplexing communication with directivity control by a communicating party; and when said determination section determines that space division multiplexing communication with directivity control is not possible, instructs said communicating party to perform

Art Unit: 2617

space division multiplexing communication without directivity control. Miyata discloses a wireless radio base station for performing space division multiplex communication with a plurality of mobile units, where a determination is made to perform space-division multiple access communication when the difference between an ideal directivity pattern and an actual directivity pattern is not larger than a predetermined value **[Page 2, paragraph 0020 - Miyata]**. Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the method of Miyata in the system of Yamada in order to accurately discern which of the mobile units communicating with the base station have an unobstructed path and which ones are not.

5. Claims 2, 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication Number 2005/0129137 (Yamada et al.) in view of U.S. Patent Application Publication Number 2004/0022205 (Miyata et al.) and further in view of U.S. Patent Number 6,704,376 (Mills et al.).

6. Regarding claims 2, 3, and 5-10, Yamada in combination with Miyata teach the limitations of claims 1 and 6. In addition, Yamada teaches that in order to improve the consistency between the transmission weights and reception weights and more effectively restrain the degradation of transmission characteristics by using the channel information that of the feedback timing as well as the current channel information that of the weight generation timing **[Page 18, paragraph 0250 -Yamada]**. Also, Miyata teaches that the wireless base station judges whether each slot is in a suitable condition for space-division multiplexing, and prohibits space-division multiplexing in a time slot

Art Unit: 2617

judged not suitable while permitting space-division multiplexing in a time slot judged suitable **[Page 1, paragraph 0008 - Miyata]**. What neither Yamada nor Miyata teach is when the correlation is approximately 1, and the receiving section receives a signal indicating that space division multiplexing communication with directivity control is performed, said transmitting section instructs to perform space division multiplexing communication with directivity control without transmitting a transmitting weight, and transmits a signal indicating that there is no channel fluctuation, and when said correlation is approximately 1 and said receiving section receives a signal indicating that space division multiplexing communication without directivity control is performed, instructs to perform space division multiplexing communication with directivity control and transmits a transmitting weight. Mills teaches a real-time multi-user detection receiver wherein the receiver correlates the received signal with a known signal (i.e. the complex conjugate of a known signature sequence) to produce a correlation value, "0" for a large positive correlation result and a "1" for a large negative correlation result **[columns 2 and 3, lines 65-67 and 1-2 – Mills]**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the correlation method of Mills in the combined system of Yamada and Miyata in order to avoid creating more interference between the transmitting mobiles that are proximate to each other.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ISAAK R. JAMA whose telephone number is (571)270-5887. The examiner can normally be reached on 7:30 - 5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester G. Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2617

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/IRJ/

/Lester Kincaid/

Supervisory Patent Examiner, Art Unit 2617